

TESTING OF THREE FACTOR FAMA-FRENCH MODEL FOR INDIAN AND US STOCK MARKET

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Abstract *The asset pricing modeling has attracted the attention of researchers and practitioners alike. The studies on asset pricing in initial years responded positively to the CAPM (Fama & Macbeth, 1973). However later studies by Stattman (1980), Banz (1981), Basu (1983), Bhandari (1988), and various other researchers found some anomalies such as size effect, leverage, value effect etc. which were not explained by CAPM. The Fama-French model (1993) is believed to capture these anomalies. We conduct the test of CAPM and three factor Fama-French model along with its variants for Indian and US capital markets. The results of our test find that though CAPM is able to capture the cross section of average returns both in India and US, still the three factor model with size and value factor can do the job better and hence is useful in pricing the financial assets of both developed and developing countries.*

Keyword: CAPM, Fama-French Model, Asset Pricing

INTRODUCTION

Investors enter into stock market with an aim to generate high returns but it comes at a cost in the form of risk. Before Markowitz (1952) introduced the risk return framework for analysing the portfolio return, investors focussed on return without taking risk into account quantitatively. Harry Markowitz introduced the idea of diversification in portfolio construction wherein he suggested that we should not put all the eggs together to draw parallel in investment arena. The model of asset pricing was designed by Sharpe (1964), Lintner (1965), and Black (1972) in the form of the most famous capital asset pricing model (CAPM). As per CAPM, the expected return of the securities is related to the market factor which is usually proxied by market portfolio. Beta factor helps to capture the market risk. The beta measures the sensitivity of the stock's return to the changes in the market conditions. The CAPM model classifies the risk into two component i.e. systematic risk and unsystematic risk. The risk associated with the market cannot be diversified and hence is non-diversifiable; this is the systematic risk. The rest of the component of the risk is firm specific risk which is also called unsystematic risk.

The work of Sharpe (1964), Lintner (1965), and Black (1972) has been the starting point to value the financial assets in the

form of capital asset pricing model (CAPM) on the basis of equilibrium model of asset pricing. In the 1960s, CAPM has been the eye candy of academicians as it was based on sound principles with empirical evidences in its favour. However, there are later studies which raised questions regarding its ability to explain the cross sectional average return of stocks. The studies by Stattman (1980), Banz (1981), Basu (1983), Bhandari (1988), and various other researchers found some anomalies such size effect, leverage, value effect etc. which were not explained by CAPM.

The comprehensive study of these anomalies and incorporating it into the asset pricing model was conducted by Fama and French (1992, 1993). Their study revealed that beta does not have much explanatory power as a stand-alone factor. However, beta factor along with two new factors, namely, size and value effect explain a large chunk of cross sectional variation of average returns.

This paper empirically examines the standard CAPM along with the Fama-French three-factor model for the Indian stock market and US stock market. We test the linear pricing relationship implied by the CAPM and the three-factor linear pricing model of Fama and French. The main motivation for conducting this study is to have a comparative view of Fama-French three factor model for emerging markets like India and the mature market like US. We have taken recent

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ten years' data which include pre and post 2008 financial crisis time period.

This study is divided in five sections. The discussion of review of literature is provided in second section. The data used

for conducting the study and the methodology employed is presented in third section. The fourth section presents the results of various tests. The final section of the study is the description of summary and conclusion of this study.

REVIEW OF LITERATURE

The first attempt to test the CAPM was in 1970s by Fama and MacBeth (1973) wherein the authors attempt to test the relationship between average return and risks for common stocks. The authors tested various hypotheses such as (i) linear relationship between risk and return, (ii) beta is the only relevant measure of risk and (iii) market risk premium is positive and significant. The authors concluded that the beta is the relevant measure of risk and unsystematic risk is not relevant. The relationship between risk and return is found to linear with positive market risk premium. Reinganum (1981) also conducted the study to test for risk return relationship in terms of CAPM. The CAPM states that the expected return of the security varies with beta factor. This study concluded that the beta factor alone is not sufficient for asset pricing. Banz (1981) noted the size effect i.e. the small firms tend to have higher return than the large firms. The same thing was later confirmed by one more study (Lakonishok & Shapiro, 1986). The relationship between average return and leverage was studied by Bhandari (1988). There are more anomalies to be noted in asset pricing such as long term reversal effect (DeBondt & Thaler, 1985). This study found out that the best performing stock in one period tend to have bad returns in later period for a long term horizon of 3 to 5 years. They assign the cause of it to the overreaction of the investors. People tend to over react to the increase or decrease in price but in the long run they realise the mistake and take corrective actions which reverse the performance of the stocks. Lakonishok, Shleifer and Vishny (1994) provide the explanations for the above mentioned behaviour. They attribute it to the reason that investors tend to extrapolate too large in future. The winner is presumed to be a winner but later they correct the mistakes and returns tend to move towards their mean value.

The anomalies pertaining to the size and value effect were modelled into an asset pricing model by Fama and French (1993). This study concluded that the beta alone is not sufficient to explain the cross sectional average returns. Though size and value effect also not enough to do so but together with beta, the three factor model is far superior than the CAPM in explaining the cross sectional return across securities. The size effect is captured with the help of market

capitalisation and the value effect is studied with the help of book to market value of company. Fama and French (2003) again confirm the findings that there is no significant relationship between the beta and portfolio returns.

The earlier studies by Yalwar (1988) and Srinivasan (1988) in India supported the CAPM but later studies by Gupta and Sehgal (1993), Madhusoodanan (1997), and Sehgal (1997) raised doubts regarding the applicability in CAPM in Indian context. Another study conducted by Ansari (2000) found very weak relationship between risk and return. There are not much empirical evidences are available for Indian market around pre and post crisis period. This study makes an attempt to fill that gap in research for Indian stock market and have a comparative view vis-a-vis US.

DATA AND METHODOLOGY

Data

The data pertains to the period from January 2006 to December 2015 for both the Indian and US capital markets. The data for 25 portfolio returns of US is collected from the open source of French Kenneth library. The one month treasury bills rate is taken as the proxy for the US risk free rate. The same data is obtained from the Kenneth Library.

The Indian capital market data pertains to the CNX NSE 500 for the proxy of market portfolio and its constituent stocks are taken for computing 25 portfolios on the basis of size and value. The data is obtained from the Prowess database. The risk free rate for India is 91 days treasury bills rate and the data for the same is obtained from the Reserve Bank of India website.

Methodology

We start the process of testing various asset pricing models by constructing 25 portfolios on the basis of size and value. These are 25 portfolios constructed on the basis of size and value variable interaction. Kenneth describes these as "The portfolios, which are constructed at the end of each June, are the intersections of 5 portfolios formed on size (market equity, ME) and 5 portfolios formed on the ratio of book equity to market equity (BE/ME). The size breakpoints for year t are the NYSE market equity quintiles at the end of June of t . BE/ME for June of year t is the book equity for the last fiscal year end in $t-1$ divided by ME for December of $t-1$. The BE/ME breakpoints are NYSE quintiles. The portfolios for July of year t to June of $t+1$ include all NYSE, AMEX, and NASDAQ stocks for which we have market equity data for December of $t-1$ and June of t , and (positive) book equity data for $t-1$ ". Similar methodology is used to construct the 25 portfolios for Indian stock market on the basis of size and value factor. The Indian counterpart of portfolios are

constructed on the basis of market capitalisation and book to market value as on December of each year and their returns are computed for each month for the coming year. S1 represents the smallest size portfolio with S5 being the big size portfolio. The value effect is captured by the increasing order of B, where B1 being the lowest BE/ME to B5 being the maximum within the given size category.

CAPM

$$R_{pt} - R_{ft} = \alpha_i + \alpha_i (R_{mt} - R_{ft}) + e_{it}$$

To test the empirical validity of CAPM the following time series model is used:

where R_{pt} is the returns on portfolio 'p' for the quarter 't', R_{ft} is the returns on the risk free security and R_{mt} is the returns on the market proxy for the quarter 't' and e_{it} is the random error term. The value of α_i should be zero under the applicability of the CAPM. The value other than zero reflect that CAPM does not capture the cross section of average return.

Asset Pricing Test-Fama French (FF) Model

$$R_{pt} - R_{ft} = \alpha_i + \alpha_i (R_{mt} - R_{ft}) + sSMB + hHML + e_{it}$$

We can use three factor Fama-French model to capture any CAPM anomaly, if it exists. The model is given as:

SMB (Small Minus Big) is the average return on five small portfolios minus the average return on five big portfolios. HML (High Minus Low) is the average return on five value portfolios minus the average return on five growth portfolios and s and h are the sensitivity coefficients of SMB and HML factors. The value of SMB and HML is computed for the Indian capital market whereas the same is obtained from Kenneth library pertaining to the US capital market.

EMPIRICAL ANALYSIS

This section discusses the result of empirical data analysis of Indian and US capital market data.

India

Test of CAPM

Table 1 gives the empirical results of CAPM test conducted for the Indian stock market data. It shows that the beta factor is positive and statistically significant for all the 25 portfolios constructed on the basis of size and value. It indicates that the market factor is an important variable in explaining the return of portfolios. The R-square is also quite high for all portfolios with 35.3% is the smallest value and 87.9% is the largest value.

In order to test whether the market factor explains the cross

section of average returns on 25 portfolios, we conduct the test of significance of intercept. According the finance theory, if CAPM explains the cross section of average returns, then the value of intercept term should not be significantly different from zero. On the basis of data analysis, we find that we fail to reject the hypothesis of zero intercept value. The result shows that the CAPM is capable of explaining the cross section of average return of portfolios. However, in order to answer whether any alternative models can do the job still better, we need to test alternative models as discussed in next paragraph. The main contention is that can we achieve better results by incorporating two additional factors, namely size and value effect.

Table 1: CAPM for India

Results of CAPM test for monthly excess returns on 25 portfolios constructed on the basis of size and value with the data for the period January 2006 to December 2015. The data is related to Indian capital market. The equation of the model is given as:

$$R_{pt} - R_{ft} = \alpha_i + \beta_i (R_{mt} - R_{ft}) + i_t$$

β_i					
	LOW	B2	B3	B4	HIGH
SMALL	1.060***	1.097***	1.199***	1.114***	1.255***
S2	1.195***	1.173***	0.948***	1.222***	1.015***
S3	1.051***	1.128***	1.122***	1.197***	1.117***
S4	0.987***	1.146***	1.124***	0.994***	0.987***
BIG	1.024***	1.005***	1.067***	1.152***	0.829***
α_i					
	LOW	B2	B3	B4	HIGH
SMALL	-0.116	0.185	0.863	0.779	1.303
S2	0.107	-0.421	0.443	0.0445	0.279
S3	0.0105	-0.917	0.0460	-0.599	-0.0148
S4	-0.740	0.0517	-0.474	-0.501	0.328
BIG	-0.0176	-0.611	-1.531	-0.590	-0.225
Adjusted R-SQUARE					
	LOW	B2	B3	B4	HIGH
SMALL	0.639	0.702	0.627	0.701	0.427
S2	0.538	0.826	0.609	0.622	0.788
S3	0.681	0.354	0.736	0.698	0.755
S4	0.407	0.787	0.879	0.657	0.801
BIG	0.559	0.613	0.353	0.713	0.518

Note: p=* <0.05, ** p<0.01, *** p<0.001

Test of Two Factor Fama-French model

Table 2 provides the results of testing two factor Fama-French model. As we can notice, the explanatory power of the models reduces drastically when we include two size factor, SMB and value factor, HML while excluding the market factor. The adjusted R-square reduces in almost all cases. This is another indication that the market factor is one of the most important factors in asset pricing. However, the main issue remains that is market factor is the only relevant factor.

Table 2: Two Factor Fama-French Model for India

Results of modified Fama-French model test for monthly excess returns on 25 portfolios constructed on the basis of size and value with the data for the period January 2006 to December 2015. The data is related to Indian capital market. The equation of the model is given as:

$$R_{pt} - R_{ft} = \alpha_i + sSMB + hHML + e_{it}$$

s					
	LOW	B2	B3	B4	HIGH
SMALL	0.403***	0.475***	0.910***	0.630***	1.182***
S2	0.990***	0.336**	0.181	0.832***	0.391***
S3	0.328**	-0.435**	0.574***	0.0415	0.0132
S4	-0.186	0.430***	0.140	-0.0470	0.105
BIG	-0.161	-0.157	-0.562***	-0.202	-0.317**
h					
	LOW	B2	B3	B4	HIGH
SMALL	-1.989***	-1.565***	-0.616*	-1.070***	0.0643
S2	-0.331	-0.827**	-1.453***	-0.336	-0.686*
S3	-1.653***	-1.872***	-0.312	-1.008**	-0.597
S4	-1.883***	-0.187	-0.517	-0.780**	-0.361
BIG	-1.289***	-0.983***	-1.555***	-0.784*	-0.566*
α_i					
	LOW	B2	B3	B4	HIGH
SMALL	0.627	0.647	0.361	0.816	0.154
S2	-0.633	-0.122	1.172	-0.490	0.400
S3	0.683	0.820	-0.209	0.156	0.557
S4	0.659	-0.0788	-0.0949	0.199	0.638
BIG	1.076	0.325	0.195	0.346	0.661
Adjusted R-SQUARE					
	LOW	B2	B3	B4	HIGH
SMALL	0.306	0.192	0.387	0.191	0.572
S2	0.460	0.057	0.215	0.344	0.092
S3	0.226	0.453	0.210	0.083	0.029
S4	0.454	0.120	0.009	0.096	-0.002
BIG	0.289	0.210	0.504	0.154	0.253

Note: p=* <0.05, ** p<0.01, *** p<0.001

Test of Three Factor Fama-French Model

The results are provided in Table 3. Now the explanatory power of the model increases even more as evident from increased R-square value. The value of R-square is now exceeding 75% in all the cases. The analysis of intercept term indicates that it is not significantly different from zero in all cases other than four portfolios. This means that three factor Fama-French model is better than standard CAPM in explaining the cross section of average returns for Indian capital market. This is in conformity with the previous studies for Indian capital market (Gregory & Sehgal, 2001) that size and value can explain the cross section of average return.

Table 3: Three Factor Fama-French Model for India

Results of three factor Fama-French model test for monthly excess returns on 25 portfolios constructed on the basis of size and value with the data for the period January 2006 to December 2015. The data is related to Indian capital market. The equation of the model is given as:

$$R_{pt} - R_{ft} = \alpha_i + \beta_i (R_{mt} - R_{ft}) + sSMB + hHML + e_{it}$$

β_i					
	LOW	B2	B3	B4	HIGH
SMALL	0.994***	1.034***	1.103***	1.041***	1.140***
S2	1.095***	1.148***	0.922***	1.144***	0.981***
S3	1.004***	1.180***	1.076***	1.208***	1.139***
S4	1.000***	1.123***	1.131***	1.015***	0.997***
BIG	1.050***	1.037***	1.141***	1.199***	0.885***
s					
	LOW	B2	B3	B4	HIGH
SMALL	0.222***	0.286***	0.709***	0.440***	0.974***
S2	0.790***	0.127*	0.0130	0.624***	0.212***
S3	0.145**	-0.650***	0.378***	-0.179**	-0.195***
S4	-0.368***	0.225***	-0.0661	-0.232***	-0.0769
BIG	-0.352***	-0.346***	-0.771***	-0.420***	-0.479***
h					
	LOW	B2	B3	B4	HIGH
SMALL	-1.599***	-1.160***	-0.183	-0.662***	0.512***
S2	0.0990	-0.376**	-1.092***	0.112	-0.301*
S3	-1.259***	-1.409***	0.110	-0.534**	-0.150
S4	-1.491***	0.253*	-0.0738	-0.382*	0.0302
BIG	-0.878***	-0.576***	-1.107***	-0.313**	-0.219
α_i					
	LOW	B2	B3	B4	HIGH
SMALL	0.395	0.406	0.103	0.573	-0.112
S2	-0.889*	-0.390	0.957*	-0.757*	0.172
S3	0.448	0.545	-0.460	-0.125	0.291

S4	0.425	-0.341	-0.359	-0.0378	0.405
BIG	0.831*	0.0834	-0.0708	0.0656	0.455
Adjusted R-SQUARE					
	LOW	B2	B3	B4	HIGH
SMALL	0.859	0.804	0.908	0.793	0.919
S2	0.904	0.834	0.780	0.880	0.814
S3	0.835	0.832	0.875	0.781	0.800
S4	0.864	0.861	0.883	0.768	0.802
BIG	0.866	0.850	0.900	0.913	0.834

Note: p=* <0.05, ** p<0.01, *** p<0.001

US

Test of CAPM

The results of the CAPM testing are provided in Table 4. The results show the similar conclusion for the US market as well. The CAPM can help in explaining the variation in cross section of average returns. The beta factor is positive and significant for all the 25 portfolios and the R-square is also reported to be above 75 % for almost all portfolios. The test of intercept of the above model regarding its explanatory power shows that it is not significantly different from zero for all the portfolios except two portfolios. The same question arises for the US capital market that whether we have any alternative model which can improve the explanatory power of the model. This is discussed in the next section.

Table 4: CAPM for US

Results of CAPM test for monthly excess returns on 25 portfolios constructed on the basis of size and value with the data for the period January 2006 to December 2015. The data is related to US capital market. The equation of the model is given as:

$$R_{pt} - R_{ft} = \alpha_i + \beta_i (R_{mt} - R_{ft}) + e_{it}$$

β_i					
	LOW	B2	B3	B4	HIGH
SMALL	1.281***	1.240***	1.177***	1.120***	1.281***
S2	1.189***	1.156***	1.189***	1.196***	1.370***
S3	1.174***	1.165***	1.153***	1.185***	1.182***
S4	1.079***	1.145***	1.260***	1.114***	1.240***
BIG	0.895***	0.870***	1.009***	1.014***	1.162***
α_i					
	LOW	B2	B3	B4	HIGH
SMALL	-0.508	-0.0380	-0.176	-0.0630	-0.0740
S2	0.137	0.233	0.227	-0.0427	-0.213
S3	0.193	0.246	0.249	0.134	0.206

S4	0.308	0.137	-0.216	0.0125	-0.175
BIG	0.273*	0.224*	-0.0654	-0.166	-0.00367
Adjusted R-SQUARE					
	LOW	B2	B3	B4	HIGH
SMALL	0.754	0.797	0.813	0.770	0.759
S2	0.782	0.838	0.833	0.828	0.765
S3	0.852	0.872	0.865	0.878	0.782
S4	0.886	0.921	0.913	0.873	0.833
BIG	0.918	0.918	0.914	0.878	0.804

Note: p=* <0.05, ** p<0.01, *** p<0.001

Test of Two Factor Fama-French Model

The results show that dropping the market factor from Fama-French model results in decreased explanatory power of the model as reflected in table 5. The adjusted R-square is reduced below 60% for almost all the 25 portfolios as noted in Table 5.

Table 5: Two Factor Fama-French for US

Results of modified Fama-French model test for monthly excess returns on 25 portfolios constructed on the basis of size and value with the data for the period January 2006 to December 2015. The data is related to US capital market. The equation of the model is given as:

$$R_{pt} - R_{ft} = \alpha_i + sSMB + hHML + e_{it}$$

s					
	LOW	B2	B3	B4	HIGH
SMALL	1.811***	1.619***	1.474***	1.393***	1.495***
S2	1.671***	1.472***	1.433***	1.329***	1.433***
S3	1.295***	1.306***	1.205***	1.079***	1.170***
S4	1.018***	0.961***	0.961***	0.840***	0.817***
BIG	0.391*	0.259	0.295	0.292	0.659***
h					
	LOW	B2	B3	B4	HIGH
SMALL	0.311*	0.389**	0.509***	0.571***	0.789***
S2	0.173	0.359**	0.478***	0.603***	0.881***
S3	0.218	0.415***	0.417***	0.530***	0.621***
S4	0.224	0.403**	0.604***	0.571***	0.914***
BIG	0.260*	0.400***	0.647***	0.750***	0.743***
α_i					
	LOW	B2	B3	B4	HIGH
SMALL	0.131	0.603	0.452	0.545	0.644
S2	0.719	0.834*	0.864*	0.621	0.576
S3	0.808	0.873*	0.879*	0.808*	0.880*

S4	0.891*	0.785	0.524	0.671	0.598
BIG	0.809*	0.773*	0.590	0.503	0.719
Adjusted R-SQUARE					
	LOW	B2	B3	B4	HIGH
SMALL	0.501	0.496	0.546	0.563	0.586
S2	0.469	0.498	0.507	0.515	0.540
S3	0.337	0.447	0.401	0.384	0.432
S4	0.272	0.303	0.343	0.346	0.458
BIG	0.108	0.154	0.272	0.337	0.326

Note: p=* <0.05, ** p<0.01, *** p<0.001

Test of Three Factor Fama-French model

The results of three factor Fama-French model are presented in Table 6. We can conclude that the best of them all is three factor Fama-French model. This model has very high explanatory power as evident from adjusted R-square values exceeding 90% for 20 out of the 25 portfolios. The intercept term is also not different from zero except six portfolios.

Table 6: Three Factor Fama-French Model for US

Results of three factor Fama-French model test for monthly excess returns on 25 portfolios constructed on the basis of size and value with the data for the period January 2006 to December 2015. The data is related to US capital market. The equation of the model is given as:

$$R_{pt} - R_{ft} = \alpha_i + \alpha_i (R_{mt} - R_{ft}) + sSMB + hHML + e_{it}$$

β_i					
	LOW	B2	B3	B4	HIGH
SMALL	1.088***	1.051***	0.952***	0.871***	0.962***
S2	1.064***	0.992***	0.995***	0.976***	1.059***
S3	1.128***	1.024***	1.036***	1.065***	0.994***
S4	1.074***	1.099***	1.166***	1.016***	1.039***
BIG	0.984***	0.925***	0.992***	0.955***	1.055***
s					
	LOW	B2	B3	B4	HIGH
SMALL	1.221***	1.049***	0.958***	0.920***	0.973***
S2	1.094***	0.933***	0.893***	0.800***	0.858***
S3	0.683***	0.751***	0.643***	0.502***	0.630***
S4	0.436***	0.365***	0.329***	0.288***	0.253**
BIG	-0.143**	-0.243***	-0.244***	-0.226***	0.0864
h					
	LOW	B2	B3	B4	HIGH
SMALL	-0.176**	-0.0829	0.0824*	0.180***	0.357***

S2	-0.304***	-0.0856*	0.0314	0.165***	0.406***
S3	-0.288***	-0.0447	-0.0473	0.0521	0.175*
S4	-0.258***	-0.0901*	0.0808	0.115*	0.448***
BIG	-0.181***	-0.0146	0.202***	0.321***	0.270***
α_i					
	LOW	B2	B3	B4	HIGH
SMALL	-0.528**	-0.0337	-0.124	0.0177	0.0621
S2	0.0749	0.233*	0.262*	0.0301	-0.0652
S3	0.125	0.253*	0.252	0.164	0.278
S4	0.241	0.119	-0.182	0.0556	-0.0314
BIG	0.213*	0.213*	-0.0108	-0.0748	0.0809
Adjusted R-SQUARE					
	LOW	B2	B3	B4	HIGH
SMALL	0.909	0.927	0.946	0.913	0.908
S2	0.941	0.963	0.945	0.931	0.883
S3	0.930	0.955	0.926	0.916	0.848
S4	0.933	0.942	0.930	0.892	0.899
BIG	0.944	0.935	0.938	0.922	0.824

Note: p=* <0.05, ** p<0.01, *** p<0.001

SUMMARY

The asset pricing modelling has come a long way since 1960s when CAPM came into existence. The earlier financial literature suggested the use of CAPM to model asset pricing in capital market. Later on, it failed to serve the purpose well though it continue to be the most popular model of asset pricing. In this study, we make an effort to study the applicability of CAPM and three factor Fama-French model for India and US stock market.

We conduct the test of asset pricing models with the help of Indian and US capital market data for the period starting from January 2006 to December 2015. The Kenneth library is used to take data for the 25 portfolios based on size and value along with the one month treasury bill rate. The Indian data is related to the stocks included in NSE 500 index to construct 25 portfolios based on size and value by using the techniques described in methodology section.

The review of the existing literature finds the evidence for the use of three factor Fama-French model whose size and value factor along with market factor can explain the cross section of average return. Fama-French (2006) state that the CAPM fails to capture the cross sectional average return which is reflected in various anomalies identified in finance such as Stattman (1980), Banz (1981), Basu (1983), and Bhandari (1988). They state that these anomalies are significantly captured by the three factor model (Fama & French, 1993). The studies on Indian stock market also showed the importance of three factor model in comparison

with standard CAPM Sehgal (1997).

The results of our test find that though CAPM is able to capture the cross section of average returns both in India and US, still the three factor model with size and value factor can do the job better and hence is useful in pricing the assets of both developed and developing countries financial markets.

Despite the fact that the three factor model is better model, there are certain questions which are left unanswered by this model. The first and the foremost criticism of this model is the economic significance of the size and value factor. This approach is also questioned on the grounds that researchers can scan past returns over and over to find factors that may uncover past "patterns" that are due purely to chance (Black, 1993). Thus, we conclude that though three factor asset pricing model fares well in asset pricing, there is consistent need to search for the macroeconomic factors which can be related to the cross section of average return and provide us the intuition in modelling the risk premium.

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